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EXAMINER	
WANG, JIN CHENG	

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2628	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)
	09/680,603	YABLONSKI ET AL.
	Examiner	Art Unit
	JIN-CHENG WANG	2628

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 February 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *47,48,50-56,58-66,68,70 and 72* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *47-48, 50-56 and 58-66, 68, 70 and 72* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

Applicant's submission filed on 2/13/2009 has been entered. Claims 1-46, 49, and 57, 67, 69, 71 have been canceled. Claims 47-48, 50-56 and 58-66, 68, 70 and 72 are pending in the application.

Response to Arguments

Applicant's arguments filed 2/13/2009 have been fully considered but are not found persuasive in view of the ground(s) of rejection based on Strasnick et al. U.S. Pat. No. 5,861,885 (hereafter Strasnick) in view of DeKimpe et al. U.S. Patent No. 6,665,682 (hereinafter DeKimpe) and Berger U.S. Patent No. 6,493,728 (hereinafter Berger).

In Remarks, Applicant repeats the claim language, cites paragraphs in the Examiner's Office Action and makes general allegations that the cited Strasnick reference does not teach the claim limitations set forth in the claim invention filed 2/13/2009.

With respect to the claim limitation of a first wall graphical user interface grid associated with a mathematical summarization of the plurality of function values associated with each of the top layer hierarchies of the multi-dimensional axes data hierarchy, the first wall graphical user interface grid perpendicular with the first axis dimension and in parallel with other graphical user interface grids, Strasnick teaches that the z-axis dimension is associated with the filter levels and heights that are selectable data objects/blocks and therefore the value hierarchies are associated with the selectable data objects/blocks and the top layer hierarchy at the z-axis dimension at the top of the filter levels is a selectable data

object. The top layer hierarchy associated with the filter levels and heights are clearly perpendicular with the x-axis and y-axis. **Strasnick teaches the third dimension axis----product items arranged in the value hierarchies wherein the value hierarchies are arranged in terms of the product items and each of the product items (***parent hierarchies at the third dimension axis***) is further divided into the product item sales and the product item quota (***children hierarchies at the third dimension axis***) wherein the product item sale represented by the heights and colors. Finally, the third axis also includes "ALL" hierarchy as a summarization for all product items in relation to the x-axis and y-axis attributes.** Strasnick further teaches at column 22, lines 20-37 that the present invention defines a set of data attributes, maps the set of data attributes into a 3D display space, enables **navigation** through the 3D display space and displays objects in the display space as columns/walls of different heights**.** Strasnick teaches at Fig. 7 **display controls** for the "ALL" hierarchy as well as "Gadget", "Widget", "Gizmo" and "Dohicky" hierarchies associated with the third dimension product axis so as to select one or more hierarchies to be displayed. Having the teaching at Figs. 7 and 14, the multi-level hierarchy navigation at the third dimension axis is amply taught in Strasnick. Thus, Strasnick teaches a top layer hierarchy associated with *the first dimension axis----- sales by hierarchical regions or employee organizations wherein "ALL" defines all regions. Strasnick teaches a top layer hierarchy associated with the second dimension axis—the time hierarchy defined by year/quarter/months wherein "YEAR" defines a top layer hierarchy for all quarters.*

Strasnick teaches a top layer hierarchy "ALL" associated with a third axis dimension and "ALL" together with the first axis dimension and the second axis dimension defines a wall plane parallel to the x-axis and y-axis. Strasnick teaches a mathematical summarization "ALL" at the

third dimension of the plurality of function values associated with each of the top layer hierarchies "ALL" at the first and second dimensions of the multi-dimensional axes data hierarchy. Strasnick discloses a multi-dimensional value hierarchy defined by "Gadget", "Widget", "Gizmo" and "Dohicky" associated with each of the function values of the multi-dimensional axes data hierarchy.

In a non-limiting example, Strasnick clearly teaches in Fig. 2a, Fig. 7 and 14 and column 22 a top layer hierarchy (e.g., the product cells such as "ALL" for all products as the hierarchy is controlled by the display control) associated with a first axis dimension (x-axis hierarchy when the function values are associated with the product cells; see column 6, lines 43-67, non-leaf cells or parent cells are regarded as cells in a top layer hierarchy) and a top layer hierarchy ("ALL" for a total of the first quarter, second quarter, third quarter and fourth quarter of Sales data and the hierarchy is controlled by the display control; see column 22, lines 10-67; see also column 16, lines 45-67 for the displayed objects along the y-axis dimension wherein the displayed objects in the y-axis dimension are in the hierarchical structure) associated with a second axis dimension (y-axis). Strasnick thus teaches a first wall graphical user interface grid characterized by a summarization of the product cells as "ALL" for all products wherein the user interface element representing "ALL" is controllable by the display control as a summarization of the product cell values associated with the top layer "products" hierarchies.

Strasnick discloses in Fig. 10B, 11 and column 22, the value hierarchies in a 3D space arranged in layers of walls including a front wall/layer graphical user interface grid in front of other layers and a summarized wall/layer graphical user interface grid within the layers of value hierarchies. Strasnick teaches a summarization layer graphical user interface grid to summarize

the function values associated with the top layer hierarchies as well as lower layer hierarchies. The function values include the summarized values associated with the top layer hierarchies wherein the function values are represented in different heights and colors to indicate the attributes of the data and the values may be summarized in a three-dimensional graph display----the summarization provides a summarized graphical user interface level for the function values associated with the top layer hierarchies of the multi-dimensional axes data hierarchy. See Fig. 11 wherein the data value hierarchies are associated with the three-dimensional graph having the first dimension axis----- sales by regions or employee organizations, the second dimension axis-----year/quarter/months, **and the third dimension axis----product items arranged in the value hierarchies wherein the value hierarchies are arranged in terms of the product items and each of the product items (***parent hierarchies at the third dimension axis***) is further divided into the product item units, product item quota and product item sales (***children hierarchies at the third dimension axis***) wherein the product item sale represented by the heights and colors.** Strasnick further teaches at column 22, lines 20-37 that the present invention defines a set of data attributes, maps the set of data attributes into a 3D display space, enables navigation through the 3D display space and displays objects in the display space as columns/walls of different heights**.** Strasnick teaches at Fig. 7 **display controls** for the "ALL" hierarchy as well as "Gadget", "Widget", "Gizmo" and "Dohicky" hierarchies associated with the third dimension product axis so as to select one or more hierarchies to be displayed. Having the teaching at Figs. 7 and 14, the multi-level hierarchy navigation at the third dimension axis is amply taught in Strasnick. **Finally, the third axis also includes "ALL" hierarchy as a summarization for all product items in relation to the x-axis and y-axis attributes**. Strasnick clearly teaches that the

sales and quota of product items are represented by the height and color and thereby a summarization of the value hierarchies is taught by Strasnick.

Applicant specifically argues that Strasnick uses the term "axis" in association with the navigation system to refer to an x axis width and a y axis height of one or more graphical objects in the display that a navigator may alter the navigator's perspective of the information landscape by adjusting the x or horizontal dimension relative to the viewpoint of the navigator (Column 16, Lines 33-63). Applicant then makes general allegations that Strasnick does not teach the claim limitations set forth in the claim 47. The Examiner respectfully disagrees with the Applicant's arguments with the Examiner’s specific reasons set forth below.

Strasnick clearly teaches in column 16, lines 33-63 X axis and Y axis which specifically meet the claim element of “axis”. Although the display data elements along the X-axis or along the Y-axis as a collection are displayed with certain width or dimensions, Strasnick still teaches the X-axis and Y-axis within a display of the information landscape in the graphical visualization of the database structure and the database objects.

In a non-limiting example, Strasnick clearly teaches in Fig. 2a, Fig. 7 and 14 and column 22 a top layer hierarchy (e.g., <u>the summarization of the product cells is represented by “ALL” for all products as the hierarchy is controlled by the display control) associated with a first axis dimension (x-axis hierarchy when the function values are associated with the product cells; see column 6, lines 43-67, non-leaf cells or parent cells are regarded as cells in a top layer hierarchy)</u> and a top layer hierarchy (<u>ALL for a total of the first quarter, second quarter, third quarter and fourth quarter of Sales data and the hierarchy is controlled by the display control; see column 22,</u>

lines 10-67; see also column 16, lines 45-67 for the displayed objects along the y-axis dimension wherein the displayed objects in the y-axis dimension are in the hierarchical structure) associated with a second axis dimension (y-axis).

Strasnick discloses in Fig. 10B, 11 and column 22 a value hierarchy wherein the values are represented in different heights and colors to indicate the attributes of the data and the values may be summarized in a three-dimensional graph display under "ALL" category. See Fig. 11 wherein the data value hierarchies are associated with the three-dimensional graph having the first dimension axis-----sales by regions or employee organizations, the second dimension axis-----year/quarter/months and the third dimension axis----product items arranged in the value hierarchies wherein the value hierarchies are arranged in terms of the product items and the product items are further *divided* into the product item quota----meaning *parent—children hierarchies along the third-axis*, the product item sale represented by the heights and colors. Strasnick further teaches "ALL" category as a *summarization* of the value hierarchies for the product items. Strasnick clearly teaches that the sales and quota of product items are represented by the height and color and thereby a summarization of the value hierarchies is taught by Strasnick.

Strasnick clearly discloses in Fig. 14 a three-dimensional hierarchy of data structures in which the data objects are navigated and visualized in the three-dimensional layout. Moreover, Strasnick discloses in column 21, lines 30-40 a hierarchical tree structure of nodes in a 3D layout

of the nodes/cells or data attributes in a hierarchy wherein the nodes/cells/attributes of the hierarchical tree are distributed/mapped to the coordinates in the 3D space and thus graphical structure has a top layer hierarchy associated with the x-axis in the 3D space, a top layer hierarchy associated with the y-axis in the 3D space and a top layer hierarchy associated with the z-axis in the 3D space (See Figs. 14-18).

Strasnick thus implicitly teaches or strongly suggests the claim limitation of a top layear hierarchy associated with a third axis dimension (See Fig. 10A, 12A and 14-18).

Moreover, the cited references either individually or in combination teach or suggest each and every element of the claim limitations set forth in the claim 47 and similar claims. For example, Berger further discloses **a computer graphical user interface system comprising**:

A database operable to store hierarchically organized data associated with a multi-dimensional hierarchy of data (*Berger Fig. 2-3C*); and

A multi-dimensional graphical user interface coupled to the database (*Berger at Fig. 2-3C discloses the OLAP database; see column 4, lines 15-25 and column 7, lines 35-45*) **and capable of user interaction to provide a multi-dimensional user interactive graph (***Berger Fig. 2-3C wherein Berger discloses a three-dimensional user interactive graph wherein the first dimension is the Customers dimension having four hierarchical levels, All, State, City and Customer. The second dimension, the Products dimension has three levels, All, Category and Product. The third dimension, the Time dimension has three levels, Year, Quarter and Month. It is inherent that the three dimensions in the three-dimensional cube have coordinates and thus represent the three dimension axis; see column 6, lines 55-67 and column 7, lines 1-58***) comprising: a multi-dimensional axes data hierarchy including a top layer hierarchy**

associated with a first axis dimension (*Berger Fig. 2-3C including the customers cells including the children cells STATES, CITIES and the individual customers*), **a top layer hierarchy associated with a second axis dimension** (*Berger Fig. 2-3C including the time YEAR or Quarter cells have the children cells such as the Month cells associated with the time dimension*), **and a top layer hierarchy associated with a third axis dimension** (*Berger Fig. 2-3C wherein the PRODUCTS cells have children cells such as the Category and Product Items associated with the product dimension*); **and a unique bottom layer hierarchy including a plurality of function values** (*e.g., quantitative values in the space cube; Berger Fig. 2-3C and column 4, lines 25-55 and column 9, lines 43-55 wherein Berger discloses that each cell in a multidimensional database has one or ore measures associated with it. In the cube, two measures are defined, Purchases and Units where Purchases is the dollar amount of a particular purchase and Units is the number of units purchased. Therefore, Berger teaches that each cell in a unique bottom layer hierarchy includes a plurality of function values such as the dollar amounts or the number of units purchased*) **associated with each of the top layer hierarchies of the multi-dimensional axes data hierarchy (***Berger Fig. 2-3C***); and a multi-dimensional value hierarchy associated with each of the function values of the multi-dimensional axes data hierarchy** (*Berger Fig. 2-3C wherein Berger discloses a three-dimensional user interactive graph wherein the first dimension is the Customers dimension having four hierarchical levels, All, State, City and Customer. The second dimension, the Products dimension has three levels, All, Category and Product. The third dimension, the Time dimension has three levels, Year, Quarter and Month. It is inherent that the three dimensions in the three-dimensional cube have coordinates and thus represent the three dimension axis; see column 6, lines 55-67 and column*

7, lines 1-58. The quantitative values---measure data of the cells in the space cube; At Fig. 2-3C and column 4, lines 25-55 and column 9, lines 43-55 Berger discloses that each cell in a multidimensional database has one or ore measures associated with it. In the cube, two measures are defined, Purchases and Units where Purchases is the dollar amount of a particular purchase and Units is the number of units purchased. Therefore, Berger teaches that each cell in a unique bottom layer hierarchy includes a plurality of function values such as the dollar amounts or the number of units purchased).

In Remarks, applicant argues that DeKimpe fails to disclose, teach or suggest independent claim 47 limitations or the limitations set forth in the similar claims. The Examiner respectfully disagrees with the applicant's arguments for the reasons discussed below.

In particular, applicant argues in essence that the cube disclosed in Dekimpe merely illustrates the structure of the database, and does not include, involve, or even relate to a 'multi-dimensional axes data hierarchy including a top layer hierarchy associated with a first axis dimension. The examiner respectfully disagrees with the applicant's argument. Dekimpe teaches or suggests the claim limitations set forth in the claim 47 for the reasons given below.

In column 6, especially, column 6, lines 53-61, it is stated, "Drilling down or up is a specific analytical technique whereby the user navigates among levels of data ranging from the most summarized (up) to the most detailed (down). The most summarized corresponding to a summarization hierarchy for each dimension. The drilling paths may be defined by the hierarchies within dimensions or other

relationships that may be dynamic within or between dimensions. For example, when viewing data for Sales 334 for the year 1997 304 in FIG. 3, a drill-down operation in the Time dimension 302 would then display members Q1 366, Q2 308, Q3 310, and Q4 312."

In Remarks, Applicant argues in essence with respect to the claim 47 and similar claims that DeKimpe failed to teach "multi-dimensional user interactive graph". The examiner respectfully disagrees with the applicant's argument. As discussed in the previously passage, DeKimpe teaches drilling down or up on the cube as the user navigates among levels of data ranging from the most summarized (up) to the most detailed (down) with respect to each dimension of the 3D space clearly teaches the claim limitation of "multi-dimensional user interactive graph". DeKimpe clearly teaches a first axis dimension, a second axis dimension and a third axis dimension in the three data dimensions illustrated in the cube of Fig. 3 with the drilling up and down capability among the levels of data hierarchies associated with the 3 dimensions of the graphical user interface. Therefore, DeKimpe is seen to teach the claim limitation set forth in the claim 47.

DeKimpe discloses the drilling paths may be defined by the hierarchies within dimensions. Having the hierarchies within dimensions means that there is a top layer hierarchy for every dimension (axis) and therefore, there is a top layer level/hierarchy associated with a third axis dimension. The cube of DeKimpe is only an example of the graphical representation of the hierarchical data structures. DeKimpe teaches in column 6 that any dimension of the three-dimensional hierarchical data has levels of data ranging from the most summarized (up) to the most detailed (down) wherein drilling paths may be defined by the hierarchies within dimensions

in which the most summarized levels correspond to the top layer hierarchies and the most summarized levels at the z-axis correspond to the top layer value hierarchy.

DeKimpe not only discloses the hierarchies within dimensions but also discloses the graphical user interface allowing a user to navigate among levels of data ranging from the most summarized (up) to the most detailed (down).

In column 6 lines 21-52, DeKimpe discloses an example of the graphical representation of the three-dimensional array of hierarchical data. It is stated, "The cube is three dimensional, with each dimension (i.e., Time, Product, and Measures) represented by an axis of the cube…Cubes generally have hierarchies or formula-based relationships of data within each dimension (axis). Consolidation involves computing all of these data relationships for one or more dimensions. An example of consolidation is adding up all sales in the first quarter. While such relationships are normally summations, any type of computational relationship or formula might be defined. Members of a dimension are included in a calculation to produce a consolidated total for a parent member. Children may themselves be consolidated levels, which requires that they have children." Thus, DeKimpe discloses the multi-dimensional axes data hierarchy.

Applicant argues that DeKimpe fails to disclose, teach or suggest independent claim 47 limitations or the limitations set forth in the similar claims. The Examiner respectfully disagrees with the applicant's arguments for the reasons discussed below.

DeKimpe teaches the claim limitation of "a top layer hierarchy associated with a third axis dimension." See DeKimpe Figs. 2 and 3; and column 6 wherein DeKimpe discloses cells in the multi-dimensional database along all dimensions and cubes have hierarchies of data within each dimension. Members of a dimension are included in a calculation to produce **a consolidated total for a parent member**. Children may themselves be consolidated levels, which requires that they have children. A member may be a child for more than one parent, and a child's multiple parents may not necessarily be at the same hierarchical level, allowing multiple hierarchical aggregations within any dimension (DeKimpe column 6). **Drilling down or up is a specific analytical technique** whereby **the user navigate among levels of data ranging from the most summarized to the most detailed**. The drilling paths may be defined by the hierarchies within dimensions or other relationships that may be dynamic within or between dimensions. For example, when viewing data for Sales 324 for the year 1997 304 in Fig. 3, **a drill-down operation** in the Time dimension 302 would then display members Q1 366, Q2 308, Q3 310 and Q4 312.

DeKimpe thus discloses a computer graphical user interface system (Fig. 3 and column 6) comprising:

A database (DeKimpe Fig. 2 and column 6 wherein Fig. 2 discloses a multi-dimensional database) operable to store hierarchically organized data associated with a multi-dimensional hierarchy of data (Fig. 3 and column 6 and Fig. 2 discloses hierarchically organized data associated with a multi-dimensional hierarchy of data) and display the multi-dimensional hierarchy of data to a user (*Fig. 3 and column 6 and Fig. 2 discloses displaying the hierarchically organized data associated with a multi-dimensional hierarchy of data*); and

A multi-dimensional graphical user interface (Fig. 3 and column 6 discloses a graphical user interface for drilling down or up the multi-levels of the data structures) coupled to the database and capable of user interaction to provide a multi-dimensional user interactive graph comprising:

A multi-dimensional axes data hierarchy (Fig. 3 and column 6) including a top layer hierarchy (e.g., the ALL product item is a parent of the children products A, B, C) associated with a first axis dimension, a top layer hierarchy (e.g., the YEAR 1997 is the parent of its children Q1, Q2, Q3 and Q4) associated with a second axis dimension, and a top layer hierarchy (e.g., Measures is the parent of its children profits, costs and sales) associated with a third axis dimension; and a unique bottom layer hierarchy including a plurality of function values associated with each of the top layer hierarchies of the multi-dimensional axes data hierarchy (See DeKimpe Figs. 2 and 3; and column 6 wherein DeKimpe discloses cells in the multi-dimensional database along <u>all dimensions</u> and cubes have hierarchies of data within each dimension. Members of a dimension are included in a calculation to produce **<u>a consolidated total for a parent member</u>**. Children may themselves be consolidated levels, which requires that they have children. A member may be a child for more than one parent, and a child's multiple parents may not necessarily be at the same hierarchical level, allowing multiple hierarchical aggregations within <u>any dimension</u> (DeKimpe column 6). **<u>Drilling down or up is a specific analytical technique</u>** whereby **<u>the user navigate among levels of data ranging from the most summarized to the most detailed</u>**. The drilling paths may be defined by the <u>hierarchies within dimensions</u> or other relationships that may be dynamic within or between dimensions); and

A multi-dimensional value hierarchy associated with each of the function values of the multi-dimensional axes data hierarchy (See DeKimpe Figs. 2 and 3; and column 6 wherein DeKimpe discloses cells in the multi-dimensional database along all dimensions and cubes have hierarchies of data within each dimension. Members of a dimension are included in a calculation to produce **a consolidated total for a parent member**. Children may themselves be consolidated levels, which requires that they have children. A member may be a child for more than one parent, and a child's multiple parents may not necessarily be at the same hierarchical level, allowing multiple hierarchical aggregations within any dimension (DeKimpe column 6). **Drilling down or up is a specific analytical technique** whereby **the user navigate among levels of data ranging from the most summarized to the most detailed**. The drilling paths may be defined by the hierarchies within dimensions or other relationships that may be dynamic within or between dimensions).

In addition to the graphical representation of the multi-dimensional hierarchical data structure in DeKimpe column 6 and Fig. 3, further examples of the multi-dimensional hierarchies can be found in Berger's OLAP database structure and the graphical representation for multi-level hierarchical data.

Applicant argues with respect to the claim 47 and similar claims that there is no motivation for combining the references. However, the motivation can be found from the cited references. It is clear from the cited references that one of the ordinary skill in the art is motivated to have combined the references because this allows the multiple dimension visual model being used to clearly present the data set to the user as organized in multiple levels along the multiple axis with each member being labeled as the database contains a plurality of data

records having multiple data attributes/levels that need to be visualized at a plurality of levels to reveal the details of the hierarchical structure of the data records (**Strasnick Figs. 14-18, column 21-22, DeKimpe Figs. 2-3 and column 6**).

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 55-56, 58-62 and 70 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The claim 55 recites "the software being embodied in a computer-readable storage medium". However, Applicant's originally filed disclosure failed to disclose the claimed computer-readable storage medium. The claims 56, 58-62 and 70 depend upon the claim 55 and are rejected due to their dependency on the claim 55.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims **55-56, 58-66, 70 and 72** are rejected under 35 U.S.C. 101 as not falling within one of the four statutory categories of invention. While the claims recite a series of steps or acts to be performed, a statutory "process" under 35 U.S.C. 101 must (1) be tied to another statutory category (such as a particular apparatus), or (2) transform underlying subject matter (such as an article or material) to a different state or thing (Reference the May 15, 2008 memorandum issued by Deputy Commissioner for Patent Examining Policy, John J. Love, titled "Clarification of 'Processes' under 35 U.S.C. 101"). The instant claims neither transform underlying subject matter nor positively tie to another statutory category that *accomplishes* the claimed method steps, and therefore do not qualify as a statutory process. The claims failed to identify a *specific* machine that <u>accomplishes</u> the method steps. For example, the claim 55 and the claim 63 failed to identify the *specific* machine that accomplishes the steps of "storing" and "providing". The steps are merely descriptive material without reaching a final result as being useful, concrete and tangible. The claim invention is not limited to a practical application and providing a (<u>*static*</u>) general purpose multi-dimensional graphical user interface is not a tangible result because it is an abstract idea (computer instruction), but not a real-world result. Using different elements/instructions to provide a (*static*) multi-dimensional graphical user interface does not mean that any hardware is *physically transformed* to a different state or thing. For instance, the involvement of a general database in the claim 63 and/or a general (*static*) graphical user interface is <u>merely an insignificant extra-solution activity</u>. Neither the claimed database nor the claimed graphical user interface is physically transformed to a different state or thing merely because the claimed method uses software implementing storing and providing. The mere recitation of a general database to collect data or graphical user interface to present data

necessary for application of *the mental process* may not make the claim patentable subject matter. As *Comiskey* recognized, "the mere use of the machine to collect data necessary for application of the mental process may not make the claim patentable subject matter." *Comiskey*, 499 F.3d at 1380 (citing *In re Grams*, 888 F.2d 835, 839-840) (Fed. Cir. 1989). *In re Bilski*, 88 USPQ2d 1385 (Fed. Cir. 2008). *In re Abele and Marshall*, 214 USPQ 682 (C.C.P.A. 1982). *Ex parte Halligan*, 89 USPQ2d 1355, U.S. Patent and Trademark Office Appeal No. 2008-1588. *Ex parte Jakobsson*, 84 USPQ2d 1511, U.S. Patent and Trademark Office Appeal No. 2006-2107, Decided April 16, 2007. *Ex parte Cornea-Hasegan*, 89 USPQ2d 1557 (Bd. Pat. App. & Int. 2009). *Ex parte Langemyr*, 89 USPQ2d 1988, U.S. Patent and Trademark Office Appeal No. 2008-1495. The claims 64-66 and 72 depend upon the claim 63 and are rejected due to their dependency on the claim 63.

The claim 55 is subject to the same rationale of rejection set forth in the claim 63. The instant claim 55 neither transforms underlying subject matter nor positively ties to another statutory category that accomplishes the claimed method steps, and therefore does not qualify as a statutory process. The steps are merely descriptive material without reaching a final result as being useful, concrete and tangible. The claim invention is not limited to a practical application and providing a multi-dimensional graphical user interface is not a tangible result because it is an abstract idea, but not a real-world result. Using different elements/instructions to provide a multi-dimensional graphical user interface does not mean that any hardware is physically transformed to a different state or thing. For example, the involvement of a general database in the claim 55 and/or a general graphical user interface is merely an insignificant extra-solution activity. Neither the claimed database nor the claimed graphical user interface is physically transformed

to a different state or thing merely because the claimed method uses software implementing storing and providing. The mere recitation of a general database to collect data or graphical user interface to present data necessary for application of the mental process may not make the claim patentable subject matter. As *Comiskey* recognized, "the mere use of the machine to collect data necessary for application of the mental process may not make the claim patentable subject matter." *Comiskey*, 499 F.3d at 1380 (citing *In re Grams*, 888 F.2d 835, 839-840) (Fed. Cir. 1989). *In re Bilski*, 88 USPQ2d 1385 (Fed. Cir. 2008). *In re Abele and Marshall*, 214 USPQ 682 (C.C.P.A. 1982). *Ex parte Halligan*, 89 USPQ2d 1355, U.S. Patent and Trademark Office Appeal No. 2008-1588. *Ex parte Jakobsson*, 84 USPQ2d 1511, U.S. Patent and Trademark Office Appeal No. 2006-2107, Decided April 16, 2007. *Ex parte Cornea-Hasegan*, 89 USPQ2d 1557 (Bd. Pat. App. & Int. 2009). *Ex parte Langemyr*, 89 USPQ2d 1988, U.S. Patent and Trademark Office Appeal No. 2008-1495.

The claims 56, 58-62 and 70 depend upon the claim 55 and are rejected due to their dependency on the claim 55.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims *47-48, 50-56 and 58-66, 68, 70 and 72* are rejected under 35 U.S.C. 103(a) as being unpatentable over Strasnick et al. U.S. Pat. No. 5,861,885 (hereafter Strasnick) in view of DeKimpe et al. U.S. Patent No. 6,665,682 (hereinafter DeKimpe) and Berger U.S. Patent No. 6,493,728 (hereinafter Berger).

1. Re Claim 47, 55, 63:

Strasnick teaches a computer graphical user interface system (See the abstract; figure 13; column 6) comprising:

A database operable to store hierarchically organized data associated with a multi-dimensional hierarchy of data (column 7-8) and display the multi-dimensional hierarchy of data to a user (<u>Figs. 1-7</u>);

A multi-dimensional graphical user interface coupled to the database and capable of user interaction to provide a multi-dimensional user interactive graph (e.g., column 7 and 8) comprising:

A multi-dimensional axes data hierarchy (*e.g., figures 1-7; column 1, 6-7 and 16*) including a top layer hierarchy associated with a first axis dimension (*e.g., departments or departments cells; see column 7-8*), a top layer hierarchy associated with a second axis dimension (*e.g., Figs. 14-18 and column 21-22, for example, the attributes associated with ALL quarters that include the children cells/quarters*), and a top layer hierarchy associated with a third axis dimension (*<u>The z-axis dimension is associated with the filter levels and heights that are selectable data objects/blocks;</u> Strasnick discloses in Fig. 10B, 11 and column 22 a value hierarchy wherein the values are represented in different heights and colors*

to indicate the attributes of the data and the values may be *<u>summarized</u>* *in a three-dimensional graph display. Strasnick not only teaches the function values associated with each of the top layer hierarchies, but also the summarization of the function values---top layer hierarchy-- so as to provide a summarization---top hierarchy associated with a third axis dimension. See Fig. 11 wherein the data value hierarchies are associated with the three-dimensional graph having* *<u>the first dimension axis----- sales by regions or employee organizations, the second dimension axis-----year/quarter/months and the third dimension axis----a summarization of product items arranged in the value hierarchies</u>*); and a unique bottom layer hierarchy (children cells) including a plurality of function values associated with each of the top layer hierarchies of the multi-dimensional axes data hierarchy;

a first wall graphical user interface grid associated with a mathematical summarization of the plurality of function values associated with each of the top layer hierarchies of the multi-dimensional axes data hierarchy, the first wall graphical user interface grid perpendicular with the first axis dimension (*<u>The z-axis dimension is associated with the filter levels and heights that are selectable data objects/blocks and therefore the value hierarchies are associated with the selectable data objects/blocks wherein the top filter level represents the top layer hierarchy for the third dimension</u>*. *Strasnick discloses in Fig. 10B, 11 and column 22 value hierarchies in a 3D space wherein the value hierarchies are arranged in layers including a front wall/layer graphical user interface grid in front of other layers. Strasnick further teaches a summarization layer graphical user interface grid to summarize the value hierarchies. The values are represented in different heights and colors to indicate the attributes of the data and the values may be* *<u>summarized</u>* *in a three-dimensional*

graph display----the summarization provides a summarized graphical user interface level for the function values associated with each of the top layer hierarchies of the multi-dimensional axes data hierarchy. See Fig. 11 wherein the data value hierarchies are associated with the three-dimensional graph having <u>the first dimension axis----- sales by regions or employee organizations, the second dimension axis-----year/quarter/months and the third dimension axis----product items arranged in the value hierarchies</u> wherein the value hierarchies are arranged in terms of the product items and the product items are further divided into the product item quota, the product item sale represented by the heights and colors. Strasnick clearly teaches that the sales and quota of product items are represented by the height and color and thereby value hierarchies is taught by Strasnick); and

and a multi-dimensional value hierarchy associated with each of the function values of the multi-dimensional axes data hierarchy (*e.g., in a non-limiting example, cells representing the salespersons' sales and axis has been taught in figures 1-7 and column 1 and 16 wherein the parent member being a department cell in the department level being the parent of all the salespersons cells belonging to the department; column 7-8*); and *the children cells are the salespersons cells belonging to the department; see for example, column 7-8, lines 10-30* and *the children salespersons cells representing the disaggregation of the department cell to which they belong. Strasnick teaches in column 7-8 and 19-22 a user selection of a cell representing the company's total sales (<u>a company cell</u>) and all the sub-cells or children cells representing the departments' sales (<u>the department cells</u>) wherein the department cells emanate from the company cell and also all the sub-cells or children cells representing the salespersons' sales (<u>the salesperson cells</u>) wherein the salespersons' cells emanate from one of the departments' cells.*

Strasnick teaches warp navigation in which a navigator warps to the hierarchical dependents or children such as *the department cells in the first level* *in response to the selection by the navigator from the company cell. Strasnick teaches warp navigation in which a navigator* *warps to the departments' cells in the first level in response to the selection by the navigator from the company cell.*

Strasnick thus teaches, in response to the user selection of the departments' cells in the first level for display of departments' sales data with respect to the x-axis by a warp navigator from the company cell, display on the graph the departments' sales data or departments' cells in the first level. Strasnick also teaches warp navigation in which a navigator *warps to the salespersons' cells in the second level in response to the selection by the navigator from one of the departments' cells*. *Strasnick discloses, in response to a user selection of the second level for display of salespersons' sales data with respect to the x-axis from a department cell by the warp navigator, display on the graph the salespersons' sales data or the salespersons' cells in the second level. Strasnick further discloses navigation and visualization in the 3D layout space wherein each dimension has the hierarchical structure of data attributes; see Fig. 7 and 14-18 and column 21-22 wherein the x-axis and y-axis dimensions are represented by the rows and columns and further the y-axis dimension has a hierarchical structure of displayed objects similar to the x-axis.* *The z-axis dimension is associated with the filter levels and heights that are selectable data objects/blocks*).

- Examiner Notes:

- Strasnick discloses hierarchy being displayed on a ground plane of the information with respect to the x-axis and y-axis (See column 1 and 16-17). Strasnick discloses hierarchy being displayed on a ground plane of the information landscape with respect to the x-axis and y-axis wherein the X- axis of every display object is narrowed or expanded. The 2D plane or 3D box upon which the information objects are drawn has the X-dimension and Y-dimension or x-axis and y-axis as clearly taught by Strasnick in column 16-17.
- Strasnick discloses adjusting a width or height of a display of the information objects relative to the viewpoint of the user. Strasnick discloses <u>the x-axis being associated with the x dimension of the sales data</u>, the x dimension or horizontal dimension for the x axis being associated with the sales data hierarchy having the parent levels and children levels displayed in the information landscape with the x-axis and y-axis of sales data for the x dimension or the horizontal dimension (see Figure 5B, column 6-8, 16-17, 20). Therefore, Strasnick reads on the claim limitation of "a first axis being associated with a first dimension of the supply chain data, the first dimension for the first axis being associated with a first predetermined hierarchical arrangement of supply chain data for the first dimension."

It needs to be shown that Strasnick discloses the claim limitation of "a top layer hierarchy associated with a third axis dimension".

In a non-limiting example, cells representing the salespersons' sales and axis has been taught in Figures 1-7 and column 1 and 16 wherein the parent member being a department cell in

the department level being the parent of all the salespersons cells belonging to the department; column 7-8); and the children cells are the salespersons cells belonging to the department----the x-axis hierarchy; see for example, column 7-8, lines 10-30 and the children salespersons cells representing the disaggregation of the department cell to which they belong. Strasnick teaches in column 7-8 and 19-22 a user selection of a cell representing the company's total sales (a company cell) and all the sub-cells or children cells representing the departments' sales (the department cells) wherein the department cells emanate from the company cell and also all the sub-cells or children cells representing the salespersons' sales (the salesperson cells) wherein the salespersons' cells emanate from one of the departments' cells. Strasnick teaches warp navigation in which a navigator warps to the hierarchical dependents or children such as the department cells in the first level in response to the selection by the navigator from the company cell. Strasnick teaches warp navigation in which a navigator warps to the departments' cells in the first level in response to the selection by the navigator from the company cell.

With respect to the claim limitation of a first wall graphical user interface grid associated with a mathematical summarization of the plurality of function values associated with each of the top layer hierarchies of the multi-dimensional axes data hierarchy, the first wall graphical user interface grid perpendicular with the first axis dimension and in parallel with other graphical user interface grids, Strasnick teaches that the z-axis dimension is associated with the filter levels and heights that are selectable data objects/blocks and therefore the value hierarchies are associated with the selectable data objects/blocks and the top layer hierarchy at the z-axis dimension at the top of the filter levels is a selectable data object. The top layer hierarchy associated with the filter levels and heights are

<u>Strasnick teaches the third dimension axis----product items arranged in the value hierarchies</u> wherein the value hierarchies are arranged in terms of the product items and each of the product items (_parent hierarchies at the third dimension axis_**) is further <u>divided</u> into the product item sales and the product item quota (**_children hierarchies at the third dimension axis_**) wherein the product item sale represented by the heights and colors. Finally, the third axis also includes "ALL" hierarchy as a summarization for all product items in relation to the x-axis and y-axis attributes.** <u>Strasnick further teaches at column 22, lines 20-37 that the present invention defines a set of data attributes, maps the set of data attributes into a 3D display space, enables **navigation** through the 3D display space and displays objects in the display space as columns/walls of different heights</u>**.** <u>Strasnick teaches at Fig. 7 **display controls** for the "ALL" hierarchy as well as "Gadget", "Widget", "Gizmo" and "Dohicky" hierarchies associated with the third dimension product axis so as to select one or more hierarchies to be displayed. Having the teaching at Figs. 7 and 14, the multi-level hierarchy navigation at the third dimension axis is amply taught in Strasnick. Thus, Strasnick teaches a top layer hierarchy associated with _the first dimension axis----- sales by hierarchical regions or employee organizations wherein "ALL" defines all regions. Strasnick teaches a top layer hierarchy associated with the second dimension axis—the time hierarchy defined by year/quarter/months wherein "YEAR" defines a top layer hierarchy for all quarters._</u>

<u>Strasnick teaches a top layer hierarchy "ALL" associated with a third axis dimension and "ALL" together with the first axis dimension and the second axis dimension defines a wall plane parallel to the x-axis and y-axis. Strasnick teaches a mathematical summarization "ALL" at the third dimension of the plurality of function values associated with each of the top layer</u>

hierarchies "ALL" at the first and second dimensions of the multi-dimensional axes data hierarchy. Strasnick discloses a multi-dimensional value hierarchy defined by "Gadget", "Widget", "Gizmo" and "Dohicky" associated with each of the function values of the multi-dimensional axes data hierarchy.

Strasnick thus clearly teaches in Fig. 2a, Fig. 7 and 14 and column 22 a top layer hierarchy (e.g., the product cells such as ALL for all products as the hierarchy is controlled by the display control) associated with a first axis dimension (x-axis hierarchy or z-axis hierarchy when the function values are associated with the product cells) and a top layer hierarchy (ALL for a total of the first quarter, second quarter, third quarter and fourth quarter of Sales data and the hierarchy is controlled by the display control; see column 22, lines 10-67; see also column 16, lines 45-67 for the displayed objects along the y-axis dimension wherein the displayed objects in the y-axis dimension are in the hierarchical structure) associated with a second axis dimension (y-axis). Strasnick discloses in Fig. 10B, 11 and column 22 a value hierarchy wherein the values are represented in different heights and colors to indicate the attributes of the data and the values may be summarized in a three-dimensional graph display. See Fig. 11 wherein the data value hierarchies are associated with the three-dimensional graph having the first dimension axis-----sales by regions or employee organizations, the second dimension axis-----year/quarter/months and the third dimension axis----product items arranged in the value hierarchies wherein the value hierarchies are arranged in terms of the product items and the product items are further divided into the product item quota, the

product item sale represented by the heights and colors. Strasnick clearly teaches that the sales and quota of product items are represented by the height and color and thereby value hierarchies is taught by Strasnick.

Strasnick clearly discloses in Fig. 14 a three-dimensional hierarchy of data structures in which the data objects are navigated and visualized in the three-dimensional layout. Moreover, Strasnick discloses in column 21, lines 30-40 a hierarchical tree structure of nodes in a 3D layout of the nodes/cells or data attributes in a hierarchy wherein the nodes/cells/attributes of the hierarchical tree are distributed/mapped to the coordinates in the 3D space and thus graphical structure has a top layer hierarchy associated with the x-axis in the 3D space, a top layer hierarchy associated with the y-axis in the 3D space and a top layer hierarchy associated with the z-axis in the 3D space (See Figs. 14-18).

Strasnick thus strongly suggests the claim limitation of a top layer hierarchy associated with a third axis dimension (See Fig. 10A, 12A and 14-18).

DeKimpe teaches the claim limitation of "a top layer hierarchy associated with a third axis dimension." See DeKimpe Figs. 2 and 3; and <u>column 6</u> wherein DeKimpe discloses cells in the multi-dimensional database along all dimensions and cubes have hierarchies of data within each dimension. Members of a dimension are included in a calculation to produce **<u>a consolidated total for a parent member</u>**. Children may themselves be consolidated levels, which require that they have children. A member may be a child for more than one parent, and a child's multiple parents may not necessarily be at the same hierarchical level, allowing multiple hierarchical aggregations within any dimension (DeKimpe column 6). **<u>Drilling down or up is a specific analytical technique</u>** whereby **<u>the user navigate among levels of data ranging from</u>**

<u>the most summarized to the most detailed</u>. The drilling paths may be defined by the <u>hierarchies within dimensions</u> or other relationships that may be dynamic within or between dimensions. For example, when viewing data for Sales 324 for the year 1997 304 in Fig. 3, **<u>a drill-down operation</u>** in the Time dimension 302 would then display members Q1 366, Q2 308, Q3 310 and Q4 312.

DeKimpe discloses that in Fig. 3, there is a cube in three-dimensional space with each dimension represented by an axis of the cube and the intersection of the dimension members are represented by cells in the multi-dimensional database.

In column 6, especially, column 6, lines 53-61, it is stated, "Drilling down or up is a specific analytical technique whereby <u>the user navigates among levels of data ranging from the most summarized (up) to the most detailed (down)</u>. The drilling paths may be defined by <u>the hierarchies within dimensions</u> or other relationships that may be <u>dynamic within or between dimensions</u>. For example, when viewing data for Sales 334 for the year 1997 304 in FIG. 3, a drill-down operation in the Time dimension 302 would then display members Q1 366, Q2 308, Q3 310, and Q4 312."

DeKimpe teaches drilling down or up on the cube as the user navigates among levels of data ranging from the most summarized (up) to the most detailed (down) clearly teaches the claim limitation of "**multi-dimensional user interactive graph**". DeKimpe clearly teaches a first axis dimension, a second axis dimension and a third axis dimension in the three data

dimensions illustrated in the cube of Fig. 3 with the drilling up and down capability among the levels of data hierarchies.

DeKimpe discloses the drilling paths may be defined by the hierarchies within dimensions. Having the hierarchies within dimensions means that there is a top layer hierarchy for every dimension (axis) and therefore, there is a top layer level/hierarchy associated with a third axis dimension. The cube of DeKimpe is only an example of the graphical representation of the hierarchical data structures. DeKimpe teaches in column 6 that any dimension of the three-dimensional hierarchical data has levels of data ranging from the most summarized (up) to the most detailed (down) wherein drilling paths may be defined by the hierarchies within dimensions.

DeKimpe not only discloses the hierarchies within dimensions but also discloses the graphical user interface allowing a user to navigate among levels of data ranging from the most summarized (up) to the most detailed (down).

> In column 6 lines 21-52, DeKimpe discloses an example of the graphical representation of the three-dimensional array of hierarchical data. It is stated, "The cube is three dimensional, with each dimension (i.e., Time, Product, and Measures) represented by an axis of the cube…Cubes generally have hierarchies or formula-based relationships of data within each dimension (axis). Consolidation involves computing all of these data relationships for one or more dimensions. An example of consolidation is adding up all sales in the first quarter. While such relationships are normally summations, any type of computational relationship or formula might be defined. Members of a dimension are included in a calculation to produce a consolidated total for a parent member. Children may themselves be consolidated levels,

which require that they have children." Thus, DeKimpe discloses the multi-dimensional axes data hierarchy.

DeKimpe thus discloses a computer graphical user interface system (Fig. 3) comprising:

A database (*DeKimpe Fig. 2 and column 6 wherein Fig. 2 discloses a multi-dimensional database*) operable to store hierarchically organized data associated with a multi-dimensional hierarchy of data (*Fig. 3 and column 6 and Fig. 2 discloses hierarchically organized data associated with a multi-dimensional hierarchy of data*) and display the multi-dimensional hierarchy of data to a user (*Fig. 3 and column 6 and Fig. 2 discloses displaying the hierarchically organized data associated with a multi-dimensional hierarchy of data*); and

A multi-dimensional graphical user interface (Fig. 3 and column 6 discloses a graphical user interface for drilling down or up the multi-levels of the data structures) coupled to the database and capable of user interaction to provide a multi-dimensional user interactive graph comprising:

A multi-dimensional axes data hierarchy (Fig. 3 and column 6) including a top layer hierarchy (e.g., the ALL product item is a parent of the children products A, B, C) associated with a first axis dimension, a top layer hierarchy (e.g., the YEAR 1997 is the parent of its children Q1, Q2, Q3 and Q4) associated with a second axis dimension, and a top layer hierarchy (e.g., Measures is the parent of its children profits, costs and sales) associated with a third axis dimension; and a unique bottom layer hierarchy including a plurality of function values associated with each of the top layer hierarchies of the multi-dimensional axes data hierarchy (*See DeKimpe Figs. 2 and 3; and column 6 wherein DeKimpe discloses cells in the multi-*

*dimensional database along all dimensions and cubes have hierarchies of data within each dimension. Members of a dimension are included in a calculation to produce **a consolidated total for a parent member**. Children may themselves be consolidated levels, which require that they have children. A member may be a child for more than one parent, and a child's multiple parents may not necessarily be at the same hierarchical level, allowing multiple hierarchical aggregations within any dimension (DeKimpe column 6). **Drilling down or up is a specific analytical technique** whereby **the user navigate among levels of data ranging from the most summarized to the most detailed**. The drilling paths may be defined by the hierarchies within dimensions or other relationships that may be dynamic within or between dimensions*); a first wall graphical user interface grid associated with a mathematical summarization of the plurality of function values associated with each of the top layer hierarchies of the multi-dimensional axes data hierarchy, the first wall graphical user interface grid perpendicular with the first axis dimension (*See DeKimpe Figs. 2 and 3; and column 6 wherein DeKimpe discloses cells in the multi-dimensional database along all dimensions and cubes have hierarchies of data within each dimension. Members of a dimension are included in a calculation to produce **a consolidated total for a parent member---the consolidated total for the top layer hierarchies as a collection forms the first wall graphical user interface grid associated with a summarization of the function values**. Children may themselves be consolidated levels, which require that they have children. A member may be a child for more than one parent, and a child's multiple parents may not necessarily be at the same hierarchical level, allowing multiple hierarchical aggregations within any dimension (DeKimpe column 6). **Drilling down or up is a specific analytical technique** whereby **the user navigate among levels of data ranging from the most summarized***

to the most detailed wherein the most summarized levels form a first wall graphical user interface. *The drilling paths may be defined by the hierarchies within dimensions or other relationships that may be dynamic within or between dimensions*), and a multi-dimensional value hierarchy associated with each of the function values of the multi-dimensional axes data hierarchy (*See DeKimpe Figs. 2 and 3; and column 6 wherein DeKimpe discloses cells in the multi-dimensional database along all dimensions and cubes have hierarchies of data within each dimension. Members of a dimension are included in a calculation to produce* ***a consolidated total for a parent member***. *Children may themselves be consolidated levels, which require that they have children. A member may be a child for more than one parent, and a child's multiple parents may not necessarily be at the same hierarchical level, allowing multiple hierarchical aggregations within any dimension (DeKimpe column 6).* ***Drilling down or up is a specific analytical technique*** *whereby* ***the user navigate among levels of data ranging from the most summarized to the most detailed***. *The drilling paths may be defined by the hierarchies within dimensions or other relationships that may be dynamic within or between dimensions*).

In addition to the graphical representation of the multi-dimensional hierarchical data structure in DeKimpe column 6 and Fig. 3, further examples of the multi-dimensional hierarchies can be found in Berger's OLAP database structure and the graphical representation for multi-level hierarchical data.

Berger further discloses **a computer graphical user interface system comprising**:

A database operable to store hierarchically organized data associated with a multi-dimensional hierarchy of data (*Berger Fig. 2-3C*); and

A multi-dimensional graphical user interface coupled to the database (*Berger at Fig. 2-3C discloses the OLAP database; see column 4, lines 15-25 and column 7, lines 35-45*) **and capable of user interaction to provide a multi-dimensional user interactive graph (***Berger Fig. 2-3C wherein Berger discloses a three-dimensional user interactive graph wherein the first dimension is the Customers dimension having four hierarchical levels, All, State, City and Customer. The second dimension, the Products dimension has three levels, All, Category and Product. The third dimension, the Time dimension has three levels, Year, Quarter and Month. It is inherent that the three dimensions in the three-dimensional cube have coordinates and thus represent the three dimension axis; see column 6, lines 55-67 and column 7, lines 1-58***) comprising: a multi-dimensional axes data hierarchy including a top layer hierarchy associated with a first axis dimension** (*Berger Fig. 2-3C including the customers cells including the children cells STATES, CITIES and the individual customers*), **a top layer hierarchy associated with a second axis dimension** (*Berger Fig. 2-3C including the time YEAR or Quarter cells have the children cells such as the Month cells associated with the time dimension*), **and a top layer hierarchy associated with a third axis dimension** (*Berger Fig. 2-3C wherein the PRODUCTS cells have children cells such as the Category and Product Items associated with the product dimension*); **and a unique bottom layer hierarchy including a plurality of function values** (*e.g., quantitative values in the space cube; Berger Fig. 2-3C and column 4, lines 25-55 and column 9, lines 43-55 wherein Berger discloses that each cell in a multidimensional database has one or ore measures associated with it. In the cube, two measures are defined, Purchases and Units where Purchases is the dollar amount of a particular purchase and Units is the number of units purchased. Therefore, Berger teaches that each cell in*

a unique bottom layer hierarchy includes a plurality of function values such as the dollar amounts or the number of units purchased) **associated with each of the top layer hierarchies of the multi-dimensional axes data hierarchy (***Berger Fig. 2-3C***); a first wall graphical user interface grid associated with a mathematical summarization of the plurality of function values associated with each of the top layer hierarchies of the multi-dimensional axes data hierarchy, the first wall graphical user interface grid perpendicular with the first axis dimension (***Berger Fig. 2-3C wherein Berger discloses a three-dimensional user interactive graph wherein the first dimension is the Customers dimension having four hierarchical levels, All, State, City and Customer. The second dimension, the Products dimension has three levels, All, Category and Product. The third dimension, the Time dimension has three levels, Year, Quarter and Month. It is inherent that the three dimensions in the three-dimensional cube have coordinates and thus represent the three dimension axis; see column 6, lines 55-67 and column 7, lines 1-58. The quantitative values---measure data of the cells in the space cube; Berger Fig. 2-3C and column 4, lines 25-55 and column 9, lines 43-55 wherein Berger discloses that each cell in a multidimensional database has one or ore measures associated with it. In the cube, two measures are defined, Purchases and Units where Purchases is the dollar amount of a particular purchase and Units is the number of units purchased. Therefore, Berger teaches that each cell in a unique bottom layer hierarchy includes a plurality of function values such as the dollar amounts or the number of units purchased. <u>The summarization of the Product Dimension—together with the top layer hierarchies in Customer dimension—ALL and in the Time dimension—YEAR forms the first wall graphical user interface grid wherein the summarization of the function values are constructed for each of the top layer hierarchies</u>*); **and**

a multi-dimensional value hierarchy associated with each of the function values of the multi-dimensional axes data hierarchy (*Berger Fig. 2-3C wherein Berger discloses a three-dimensional user interactive graph wherein the first dimension is the Customers dimension having four hierarchical levels, All, State, City and Customer. The second dimension, the Products dimension has three levels, All, Category and Product. The third dimension, the Time dimension has three levels, Year, Quarter and Month. It is inherent that the three dimensions in the three-dimensional cube have coordinates and thus represent the three dimension axis; see column 6, lines 55-67 and column 7, lines 1-58. The quantitative values---measure data of the cells in the space cube; Berger Fig. 2-3C and column 4, lines 25-55 and column 9, lines 43-55 wherein Berger discloses that each cell in a multidimensional database has one or ore measures associated with it. In the cube, two measures are defined, Purchases and Units where Purchases is the dollar amount of a particular purchase and Units is the number of units purchased. Therefore, Berger teaches that each cell in a unique bottom layer hierarchy includes a plurality of function values such as the dollar amounts or the number of units purchased*).

It would have been obvious to one of the ordinary skill in the art at the time of invention was made to have incorporated DeKimpe or Berger's multi-dimensional user graphical interface because Strasnick's multi-dimensional data hierarchy and drilling up and down the hierarchical structure and thus suggests drilling up and down multi-dimensional hierarchies including the three-dimensional hierarchy in the three-dimensional layout of the hierarchical structures of displayed objects (See Strasnick Figs. 14-18 and column 21-22 and DeKimpe column 6). Moreover, Dekimpe teaches other claim limitations set forth in claim 47 as well including a

database operable to store hierarchically organized data associated with a multi-dimensional hierarchy of data and a multi-dimensional graphical user interface (drilling up and drilling down in Fig. 3) interaction to provide a multi-dimensional user interactive graph (cubes or hypercubes in column 6).

Strasnick implicitly discloses hierarchy being displayed on a ground plane of the information landscape with respect to the x-axis and y-axis wherein the X- axis of every display object is narrowed or expanded. The 2D plane or 3D box upon which the information objects are drawn has the X-dimension and Y-dimension or x-axis and y-axis as clearly taught by Strasnick in column 16-17, 21-22 as well as Figs. 14-18. In a non-limiting example, Strasnick discloses adjusting a width or height of a display of the information objects relative to the viewpoint of the user. Strasnick discloses the x-axis being associated with the x dimension of the sales data, the x dimension or horizontal dimension for the x axis being associated with the sales data hierarchy having the parent levels and children levels displayed in the information landscape with the x-axis and y-axis of sales data for the x dimension or the horizontal dimension (see Strasnick Figure 5B, column 6-8, 16-17, 20). Moreover, Strasnick teaches in column 7-8 and 19-22 a user selection of a cell representing the company's total sales (a company cell) and all the sub-cells or children cells representing the departments' sales (the department cells) wherein the department cells emanate from the company cell and also all the sub-cells or children cells representing the salespersons' sales (the salesperson cells) wherein the salespersons' cells emanate from one of the departments' cells.

Strasnick teaches warp navigation in which a navigator warps to the hierarchical dependents or children such as the department cells in the first level in response to the selection

by the navigator from the company cell. Strasnick teaches warp navigation in which a navigator warps to the departments' cells in the first level in response to the selection by the navigator from the company cell. Strasnick thus teaches, in response to the user selection of the departments' cells in the first level for display of departments' sales data with respect to the x-axis by a warp navigator from the company cell, display on the graph the departments' sales data or departments' cells in the first level.

Strasnick also teaches warp navigation in which a navigator warps to the salespersons' cells in the second level in response to the selection by the navigator from one of the departments' cells. Strasnick discloses, in response to a user selection of the second level for display of salespersons' sales data with respect to the x-axis from a department cell by the warp navigator, display on the graph the salespersons' sales data or the salespersons' cells in the second level.

One of the ordinary skill in the art is motivated to have combined the references because this allows the multiple dimension visual model being used to clearly present the data set to the user as organized in multiple levels along the multiple axis with each member being labeled as the database contains a plurality of data records having multiple data attributes/levels that need to be visualized at a plurality of levels to reveal the details of the hierarchical structure of the data records (**Strasnick Figs. 14-18, column 21-22, DeKimpe Figs. 2-3 and column 6 and Berger Figs. 2-3C**).

Re Claims 48, 56, 64:

Strasnick further discloses the claimed limitation of the first dimension comprising a seller dimension associated with a seller hierarchy (column 6-8); each of the plurality of members in the first level of the seller hierarchy representing all sellers within a corresponding geographic region (column 7); and each of the plurality of members in the second level of the seller hierarchy representing all sellers within a corresponding sub-region of a region represented by a member in the first level (column 8). Therefore, Strasnick discloses the claim limitation of "a plurality of levels of hierarchies associated with the top layer hierarchy, and the bottom layer hierarchy associated with each of the plurality of levels of hierarchies."

Strasnick further discloses the claimed limitation of the first dimension comprising a product dimension associated with a product hierarchy; each of the plurality of members in the first level of the product hierarchy representing all products associated with a corresponding product category; and each of the plurality of members in the second level of the product hierarchy representing all products associated with a corresponding sub-category of a product category represented by a member in the first level (column 22).

Strasnick further discloses the claimed limitation of the first dimension comprising a time dimension associated with a time hierarchy; each of the plurality of members in the first level of the time hierarchy representing all times with a corresponding time period; and each of the plurality of members in the second level of the time hierarchy representing all times within a corresponding sub-period of a time period represented by a member in the first level (column 22).

Strasnick and DeKimpe further disclose the claimed limitation of the graph comprising three axes, each axis associated with a dimension of the supply chain, each dimension of supply chain data being associated with a predetermined hierarchical arrangement of supply chain data for the dimension (e.g., Strasnick figure 1; column 1 and 3; **DeKimpe Figs. 2-3 and column 6**).

Therefore, Strasnick discloses the claim limitation of "a top layer hierarchy associated with a third axis dimension, and the bottom layer hierarchy associated with the top layer hierarchy of the third axis dimension."

Re Claims 50-51, 58-59, 65

Strasnick further discloses the claim limitation of displaying a window indicating the particular member specified in the filter selection, and in response to selection the particular member displayed in the window, display on the first axis of the graph a graphical representation of supply chain data for the particular member in addition to the graphical representation of supply chain data for the other members in the level of the particular member (column 8 and 20).

Strasnick and DeKimpe further disclose the claim limitation of receiving a filter selection specifying a particular member within a level for which a graphical representation of supply chain data for the particular member is not to be displayed on the graph; and in response to receiving the filter selection and selection of a level for display of supply chain data with respect to the first axis, display on the graph a graphical representation of supply chain data for each member in the selected level other than the particular member specified in the filter selection (Strasnick column 8 and 20 and **DeKimpe Figs. 2-3 and column 6**).

Therefore, Strasnick and DeKimpe disclose the claim limitation of "filtering at least a portion of the plurality of levels of hierarchies and in response the filtered levels of hierarchies disappear from the multi-dimensional user interactive graph and the multi-dimensional graphical user interface displays the filtered levels of hierarchies in a separate filtered window."

Strasnick and DeKimpe further disclose the claimed limitation of the GUI operable to, in response to selection of a particular member of the first level for display of supply chain data with respect to the first axis, display on the graph a graphical representation of supply chain data for the selected particular member (Strasnick column 8 and 20 and **<u>DeKimpe Figs. 2-3 and column 6</u>**).

Therefore, Strasnick and DeKimpe disclose the claim limitation of "the multi-dimensional graphical user interface allows for a user navigation of the multi-dimensional axes data hierarchy by drilling into the top layer hierarchies associated with each of the axis dimensions."

Re Claims 52-54, 60-62, 66:

Strasnick further discloses the claim limitation of displaying a window indicating the particular member specified in the filter selection, and in response to selection the particular member displayed in the window, display on the first axis of the graph a graphical representation of supply chain data for the particular member in addition to the graphical representation of supply chain data for the other members in the level of the particular member (Strasnick column 8 and 20).

Therefore, Strasnick and DeKimpe disclose the claim limitation of allowing the function value to be graphed over user selectable aggregations of user input data.

Strasnick and DeKimpe further disclose the claim limitation of receiving a filter selection specifying a particular member within a level for which a graphical representation of supply chain data for the particular member is not to be displayed on the graph; and in response to receiving the filter selection and selection of a level for display of supply chain data with respect to the first axis, display on the graph a graphical representation of supply chain data for each member in the selected level other than the particular member specified in the filter selection (Strasnick column 8 and 20 and **<u>DeKimpe Figs. 2-3 and column 6</u>**).

Therefore, Strasnick and DeKimpe disclose the claim limitation of "filtering at least a portion of the multi-dimensional value hierarchies and in response the filtered value hierarchies disappear from the multi-dimensional user interactive graph and the multi-dimensional graphical user interface displays the filtered value hierarchies in a separate filtered legend window."

Strasnick and DeKimpe further disclose the claimed limitation of the GUI operable to, in response to selection of a particular member of the first level for display of supply chain data with respect to the first axis, display on the graph a graphical representation of supply chain data for the selected particular member and the mathematical combinations can also be displayed (Strasnick column 8 and 20; **<u>DeKimpe Figs. 2-3 and column 6</u>**).

Therefore, Strasnick and DeKimpe disclose the claim limitation of "providing for user interaction of complex mathematical combinations of the multi-dimensional axes data hierarchy".

Re Claims 68, 70 and 72:

Strasnick and DeKimpe further disclose the claimed limitation of the GUI operable to, in response to selection of a particular member of the first level for display of supply chain data with respect to the first axis, display on the graph a graphical representation of the mathematical combinations for each of the top layer hierarchies of the multi-dimensional axes data hierarchy (Strasnick column 8 and 20; **DeKimpe Figs. 2-3 and column 6**).

Berger further teaches in Figs. 2-3c a first wall graphical user interface grid associated with a mathematical summarization of the plurality of function values associated with each of the top layer hierarchies of the multi-dimensional axes data hierarchy and a second wall graphical user interface grid associated with the mathematical summarization of the plurality of function values associated with each of the top layer hierarchies of the multi-dimensional axes data hierarchy, the second wall graphical user interface grid perpendicular with the second axis dimension.

Strasnick teaches that the z-axis dimension is associated with the filter levels and heights that are selectable data objects/blocks and therefore the value hierarchies are associated with the selectable data objects/blocks. Strasnick discloses in Fig. 10B, 11 and column 22 value hierarchies in a 3D space arranged in layers including a front wall/layer graphical user interface grid in front of other layers and a summarized wall/layer graphical user interface grid within the layers of value hierarchies. Strasnick teaches a summarization layer graphical user interface grid to summarize the value hierarchies. The values are represented in different heights and colors to indicate the attributes of the data and the values may be summarized in a three-dimensional graph display----the summarization provides a summarized graphical user interface level for the function values associated with each of the top

layer hierarchies of the multi-dimensional axes data hierarchy. See Fig. 11 wherein the data value hierarchies are associated with the three-dimensional graph having the first dimension axis----- sales by regions or employee organizations, the second dimension axis----- year/quarter/months and the third dimension axis----product items arranged in the value hierarchies wherein the value hierarchies are arranged in terms of the product items and the product items are further divided into the product item quota, the product item sale represented by the heights and colors. Strasnick clearly teaches that the sales and quota of product items are represented by the height and color and thereby value hierarchies is taught by Strasnick.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jin-Cheng Wang whose telephone number is (571) 272-7665. The examiner can normally be reached on 8:00 - 6:30 (Mon-Thu).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kee Tung can be reached on (571) 272-7794. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Jin-Cheng Wang/
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